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June 16, 2003

Bill Pennington,
California Energy Commission
1516 9th Street, MS 25
Sacramento, CA 95814

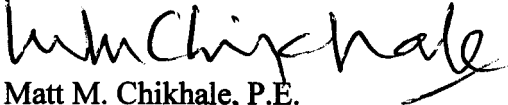
Re: Title 24 Documents (2005)

Dear Mr. Pennington,

Please find enclosed herewith
Our recommendations and proposed changes
to 2005 Title 24 Documents that are under consideration.

Please keep us informed on the upcoming hearings
so that we may address CEC appointed
distinguished panel of experts.

Truly yours,
MMC ASSOCIATES



Matt M. Chikhale, P.E.
Chairperson, ASHRAE Gold4en Gate Chapter

Copy to Code Committee Members

Arthur Bree

Craig Corson

Lyn Longley

Andrew Ostrowski

Dennis Thompson

Hugh Tuck

Scott Wayland

Golden Gate Chapter Code Committee

Proposed Changes to Title 24 Revisions

Comment 1.

Section: 144 a)

Proposed change: Revise to read:

~~(a) Load Calculations Sizing and Equipment Selection. Mechanical heating and mechanical cooling equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building, as calculated according to Heating and cooling system design loads for the purpose of sizing systems and equipment shall be determined in accordance with Subsection (b).~~

~~EXCEPTION 1 to Section 144 (a): Where it can be demonstrated to the satisfaction of the enforcing agency that oversizing will not increase building source TDV energy use.~~

~~EXCEPTION 2 to Section 144 (a): Standby equipment with controls that allow the standby equipment to operate only when the primary equipment is not operating.~~

~~EXCEPTION 3 to Section 144 (a): Multiple units of the same equipment type, such as multiple chillers and boilers, having combined capacities exceeding the design load, if they have controls that sequence or otherwise optimally control the operation of each unit based on load.~~

Rationale:

The current wording has so many loopholes and exceptions that it is basically unenforceable, and accordingly it is almost uniformly unenforced. For instance, load calculation assumptions are necessarily barely constrained by 144 b) allowing designers to justify almost any size of equipment.

The proposed language is consistent with ASHRAE Standard 90.1-2001. It retains the requirement that load calculations be performed but does not directly constrain equipment selection. The argument is that if a load calculation is done, it is likely that oversizing will not occur due to market forces: it is less expensive to correctly size equipment than to oversize equipment.

Eliminating this sizing requirement, which truly has almost no impact on equipment selection, will reduce the cost to designers of documenting compliance, reduce the cost of review by enforcement officials (where it is done), and reduce significant amounts of wasted paper by eliminating documentation forms (which can be voluminous for projects with many pieces of heating/cooling equipment).

Golden Gate Chapter Code Committee

Proposed Changes to Title 24 Revisions

Comment 2.

Section: 121 b)

Proposed change: Do not limit the change from 20 feet to 25 feet for naturally ventilated spaces to residential occupancies.

Rational: The change from 20 to 25 feet is to be consistent with Standard 62, which applies to all but industrial occupancies. Floor area will increase with space depth, so allowing naturally ventilated spaces to be deeper will be compensated for by an increase in minimum openable area.

The Standard 62 requirement was internationally publicly reviewed with no unresolved comments on this dimension. Standard 62 is an ANSI standard and the basis of ventilation requirements in most US States and in many foreign countries. The CEC must be able to provide a rationale for not using wording consistent with Standard 62.

Moreover, naturally ventilated spaces should be encouraged, not discouraged. The USGBC Leadership in Energy and Environmental Design program, for example, gives credit for buildings with operable windows since they are widely viewed as providing more acceptable indoor air quality than mechanical buildings. Hedge et al ("Indoor Air Quality and Health in Two Office Buildings with Different ventilation Systems", Environment International, Vol 15, pp. 115-128.) found that even where naturally ventilated buildings had the lowest air change rates and highest pollutant concentrations, they reported fewer IAQ complaints than mechanically ventilated buildings.

Golden Gate Chapter Code Committee

Proposed Changes to Title 24 Revisions

Comment 3.

Section: 121 c) 1

Proposed change: Add a sentence:

1. **Times of occupancy.** The minimum rate of outdoor air required by Section 121 (b) 2 shall be supplied to each space at all times when the space is usually occupied. Note: VAV systems must comply with this requirement at minimum supply airflow.

Rational: This change is consistent with Standard 62, addendum 62u. The requirement that outdoor air rates be delivered under all conditions in VAV systems is routinely ignored so it is important that the requirement be made clearer. Tests added to the ACM manual are already written to test for this condition. Note that this is not a change or additional requirement; it is just making clearer what the current requirement already states.

Golden Gate Chapter Code Committee

Proposed Changes to Title 24 Revisions

Comment 4.

Section: 149 (b) 1 D and E

Proposed change: Delete these sections.

Rational: These requirements are not practical or life cycle cost justified for the following reasons:

- Section D would require that an entire system be tested if even one foot of ductwork was added to a system during a repair or tenant improvement.
- Many older systems have asbestos insulation or sealant which would require abatement before systems could be tested or resealed, significantly increasing costs.
- CEC Cost effectiveness calculations were based on the assumption that duct systems were entirely new and thus readily accessible for sealing. That is not the case for an existing system where much of the ductwork may be concealed and require significant work in order to gain access for resealing and subsequent repair.

In summary, we do not feel that these requirements are cost effective in retrofit applications and insist that the CEC demonstrate cost effectiveness before promulgating these requirements.

We also feel that if these expensive requirements are retained, there will be a tendency for:

- HVAC and ductwork revisions to be done without a permit, which in turn can result in noncompliance with other codes including safety codes.
- Replacement of older, less efficient HVAC equipment to be deferred, which may result in a net increase in energy usage.